

Section WFP 2-01 – Welding Fabrication Procedure

Rev. 0, 8/16/04

Attachment 2, ASME B31.3, "Process Piping" Acceptance Criteria

1.0 ACCEPTANCE CRITERIA FOR COMPLETED WELDS**1.1 Butt Welds**

- 1.1.1 As-welded surfaces are permitted; however, the surface of welds shall be sufficiently free from coarse ripples, grooves, overlaps, abrupt ridges, undercut, and valleys.
- 1.1.2 The surface condition of the finished welds shall be suitable for the proper interpretation of radiographic and other nondestructive examinations when nondestructive examinations are required. In those cases where there is a question regarding the surface condition on the interpretation of a radiographic film, the film shall be compared to the actual weld surface for interpretation and determination of acceptability.
- 1.1.3 Undercuts shall not exceed $\frac{1}{32}$ in. and shall not encroach on the minimum required section thickness.
- 1.1.4 For single-welded joints (i.e., butt joints welded from one side), concavity of the root surface shall not reduce the total thickness of the joint, including reinforcement, to less than the nominal thickness of the thinner component being joined. (This applies only when inside surface of the weld is readily accessible or the weld has been radiographed.)
- 1.1.5 For single welded joints, the excess root penetration shall be limited to the lesser of $\frac{1}{8}$ in. or 25 % of the nominal wall thickness of the thinner component being joined, down to $\frac{1}{4}$ in. wall thickness. For any nominal wall thickness less than $\frac{1}{4}$ in., the excess penetration shall be limited to $\frac{1}{16}$ in. (applies only when inside surface of the weld is readily accessible or the weld has been radiographed).
- 1.1.6 Weld reinforcement greater than the amounts specified in the weld reinforcement table at the end of this attachment shall be considered unacceptable.

1.2 Socket and Fillet Welds

- 1.2.1 As-welded surfaces are permitted; however, the surface of welds shall be sufficiently free from coarse ripples, grooves, overlaps, abrupt ridges, undercut, and valleys.
- 1.2.2 The surface condition of the finished welds shall be suitable for the proper interpretation of nondestructive examinations.
- 1.2.3 Socket and fillet welds may vary from convex to concave. The size of a fillet weld is determined as shown in fillet weld diagrams at the end of this attachment.

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Typical minimum fillet weld details for slip-on flanges and socket-welding components are also contained in fillet weld diagrams at the end of this attachment.

- 1.3 Progressive sampling for radiographic examination of welds shall be in accordance with Exhibit 1.

**WELD REINFORCEMENT TABLE
ASME B31.3**

Thickness of Base Material	Thickness of Reinforcement or Internal Weld Protrusion
¼ in. and under	$\frac{1}{16}$ in.
Over ¼ in. to ½ in.	$\frac{1}{8}$ in.
Over ½ in. to 1 in.	$\frac{5}{32}$ in.
Over 1 in.	$\frac{3}{16}$ in.

Note: External weld reinforcement and internal weld protrusion shall be fused with and shall merge smoothly into the component surface.

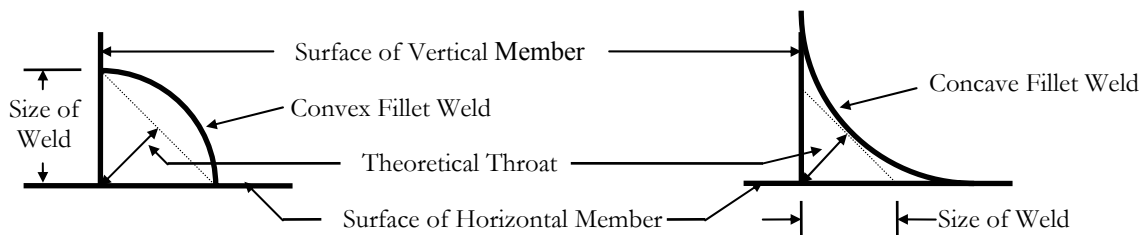
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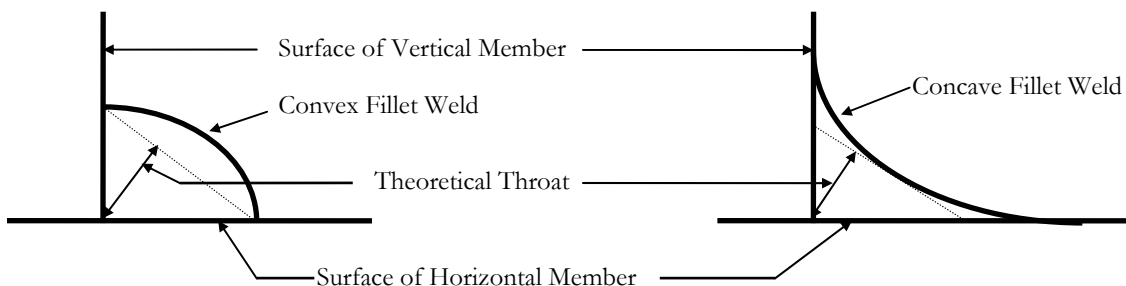
FILLET WELD PROFILES AND SLIP-ON / SOCKET WELDED FLANGES WELD PROFILES

Equal Leg Fillet Weld



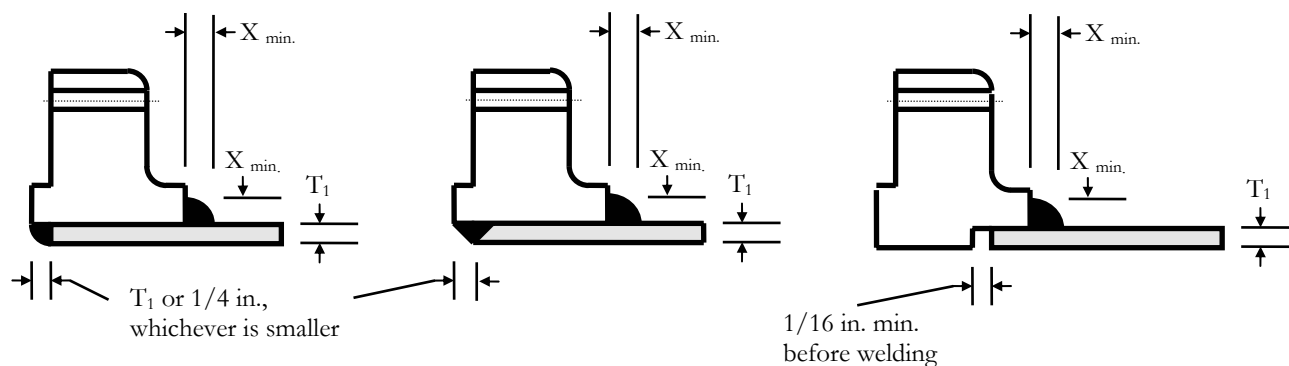
The “size” of an equal leg fillet weld is the length of the largest inscribed right isosceles triangle. Theoretical Throat = $0.7 \times \text{Size}$.

Unequal Leg Fillet Weld



For unequal leg fillet welds, the “size” of the weld is the leg length of the largest right triangle which can be inscribed within the fillet weld cross section.

Slip-on and Socket Welded Flanges



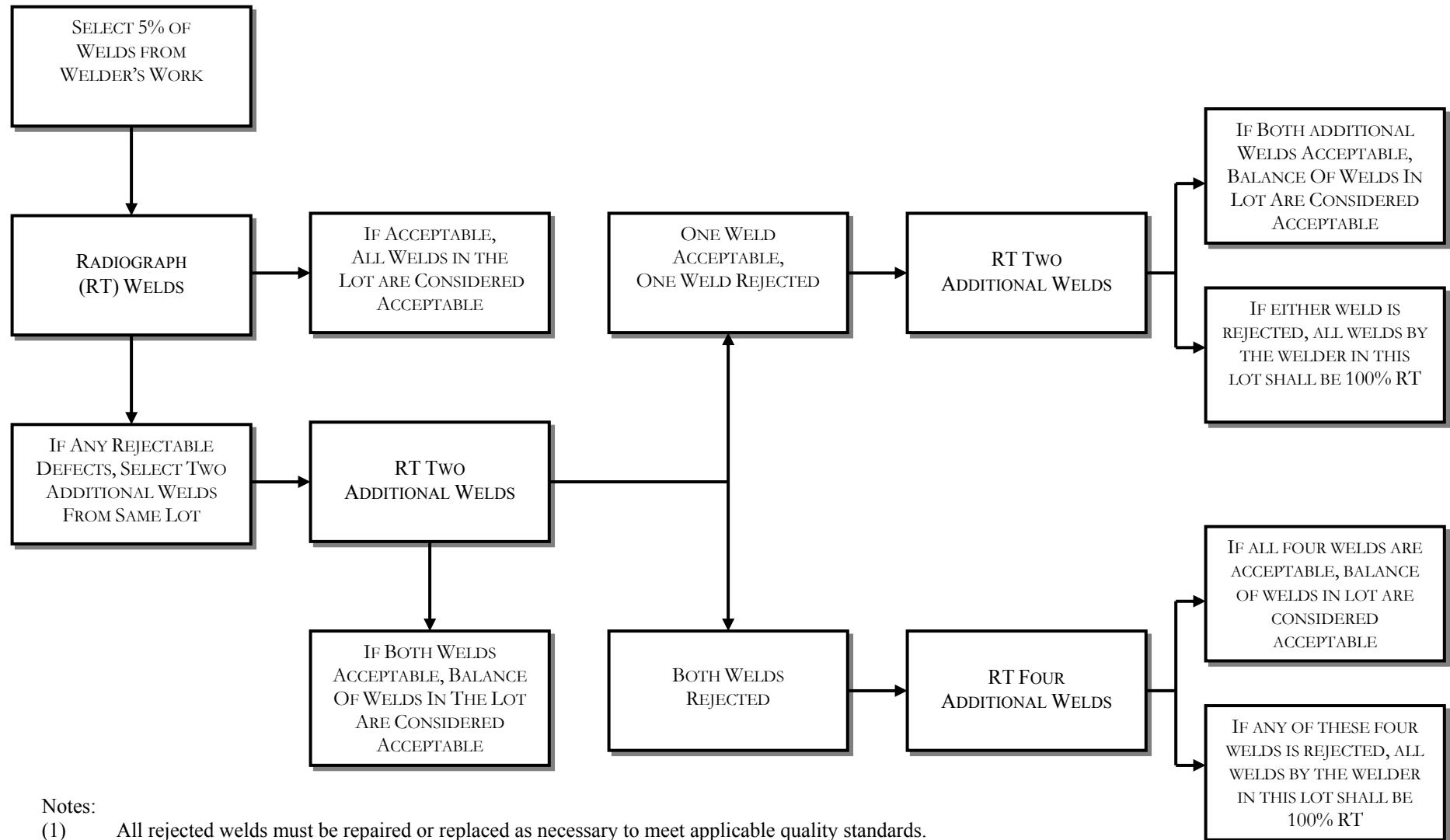
$X_{min.} = 1.4 T_1$ or thickness of the Hub, whichever is smaller, but not less than $1/8$ in.. T_1 = minimum pipe wall thickness.

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Attachment 2, ASME B31.3, “Process Piping” Exhibit 1- Progressive Sampling

PROGRESSIVE SAMPLING FOR ASME B31.3 RADIOGRAPHIC EXAMINATION



Notes:

- (1) All rejected welds must be repaired or replaced as necessary to meet applicable quality standards.
- (2) Welder may be required to demonstrate ability to perform welds meeting the quality standards.
- (3) Progressive sampling may also be applied for required visual examination (VT).
- (4) The Flow chart may be applied with the Ultrasonic method an alternative to RT.